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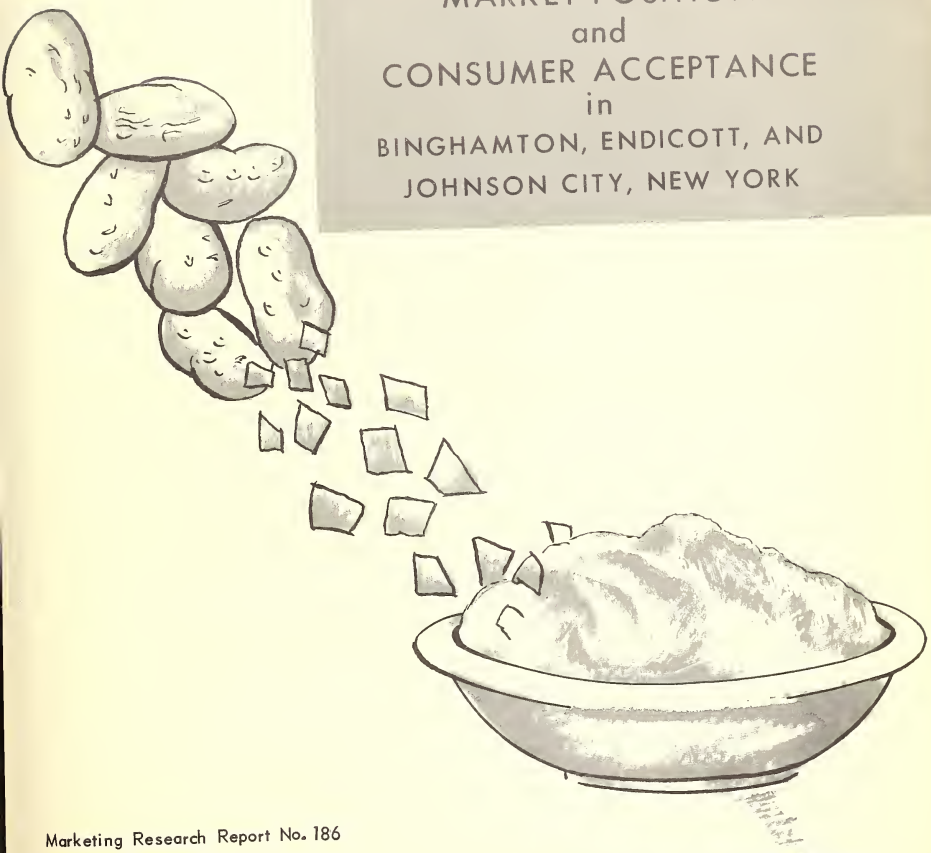
POTATO FLAKES

A New Form of Dehydrated Mashed Potatoes

MARKET POSITION
and
CONSUMER ACCEPTANCE
in
BINGHAMTON, ENDICOTT, AND
JOHNSON CITY, NEW YORK



Marketing Research Report No. 186

U. S. DEPARTMENT OF AGRICULTURE
Agricultural Marketing Service
Marketing Research Division

Washington, D.C.

PREFACE

This study illustrates the growing area of cooperative research between personnel of the Marketing Research Division, Agricultural Marketing Service, and Utilization Research and Development, Agricultural Research Service. Social and physical scientists combine their talents to provide answers concerning the commercial feasibility of new products developed by utilization researchers of the U. S. Department of Agriculture. The social scientist appraises the commercial feasibility of a new product in terms of its acceptance by consumers, the effect of this product on other agricultural commodities, the pricing structures involved, and the ultimate effect of the innovation upon producer returns. The physical scientist is interested not only in the consumer acceptance of the new product in terms of sales, but in consumer reaction to the product as to size of package, directions for use, utilization, and other household problems. If problems relating to these factors arise, researchers are provided with guides for further developmental work.

A primary objective of this type of cooperative research is to provide producers, processors, and others with facts concerning the market possibilities for the new product being tested so as to enable them to make production and marketing decisions. In this study, several such groups cooperated in the conduct of this research.

The following organizations of the State of Maine and the U. S. Department of Agriculture cooperated in the study:

The Maine Agricultural Experiment Station helped plan the project, assisted in the field phase of the project, and acted as coordinator among the other Maine agencies participating in the project.

The Maine Potato Commission provided the raw materials to be processed into potato flakes and the funds for packaging and distributing the test product, extended the services of their advertising agency for preparing the advertising and promotional materials, and provided the funds for the advertising and promotional campaign in the market test area.

The Maine State Department of Agriculture provided the services of merchandising specialists who worked directly with wholesale and retail operators in distributing the test product as well as working on the package design of the product.

The Eastern Utilization Research and Development Division of the Agricultural Research Service, developers of the product, processed the test product and consulted on the package requirements. In addition, this Division provided technical supervision and consultation in all phases of the market test.

The Market Development Branch, Marketing Research Division, AMS, assumed overall responsibility for coordination of all phases of the market test, conduct of research, analysis of data, and publication of final results.

ACKNOWLEDGMENTS

This study was conducted under the general supervision of Marshall E. Miller and Trienah Meyers of the Market Development Branch, Agricultural Marketing Service. Harry H. Harp and David J. Fitch supervised the sales audits of retail food stores.

The following individuals deserve special mention for their contribution to the planning for and execution of the market test: R. K. Eskew, James Cording, Jr., Paul W. Edwards, Eastern Utilization Research and Development Division, Agricultural Research Service, U. S. Department of Agriculture; George F. Dow and Alvah L. Perry, Maine Agricultural Experiment Station, University of Maine, Orono, Maine; A. K. Gardner, Maine Potato Commission, Presque Isle, Maine; and George H. Chick and Stanley T. Browne, Maine State Department of Agriculture, Augusta, Maine.

Sincere appreciation is extended to retail food store management, both chain and independent, in the Binghamton, N. Y., area for the successful conduct of this test.

Thanks are expressed to potato chip processors and distributors, advertising department personnel of the Binghamton Press, and the many individuals, especially store demonstrators, store audit enumerators, household interviewers, and other local groups and individuals who helped make this work possible.

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CONTENTS

	Page
Summary	1
Introduction	2
Background	2
Trends in potato utilization	3
Potato flake process	4
Test methods	6
Selection and characteristics of the market test area	6
Outline of the test	8
Retail store audit	8
Household survey	9
Market test results	11
Total sales of potato flakes	11
Sales in sample supermarkets	11
Promotional campaign	12
How consumers became aware of the product	14
In-store demonstrations	14
Purchase pattern	16
Repeat purchases	17
Homemakers' opinions about potato flakes	19
General satisfaction with potato flakes	19
Satisfaction with taste of potato flakes	19
Homemakers' opinions about factors other than taste	21
Instructions and reconstitution	22
Box size and adequacy	22
Potato flakes and competing products	23
Household use patterns of potatoes and potato products	23
Comparisons based on sales audit data	24
Product by product comparisons	27
An assessment: Market test factors and product potential	33
Market test factors	33
Estimates of the potential for potato flakes	34
Estimated potato flakes sales for all triple-city retail food stores	35
Weekly sales of potato flakes compared with frozen grapefruit sections	35
Estimated amounts of potato flakes bought by purchasing households	35
Comparison with frozen french fried potatoes	37
Expectancy as to purchase of potato flakes by consumers	37
Appendix	38

Washington, D. C. July 1957

POTATO FLAKES--A NEW FORM OF DEHYDRATED MASHED POTATOES: MARKET POSITION AND CONSUMER ACCEPTANCE IN BINGHAMTON, ENDICOTT, AND JOHNSON CITY, NEW YORK

By Philip B. Dwoskin and Milton Jacobs
Market Development Branch

SUMMARY

A market test for potato flakes, a new form of dehydrated mashed potatoes developed by the Eastern Utilization Research and Development Division, Agricultural Research Service, was conducted in the triple-cities area of Binghamton, Endicott, and Johnson City, N. Y., during the summer of 1956. Assessment of the commercial possibilities of potato flakes was determined by a combination of two techniques--retail store audit and consumer survey

Virtually the entire supply of potato flakes available, or about 900 cases (24 boxes per case, 4 servings per box), was sold in a 5-week period. The sales of potato flakes represented more than 28,000 pounds on a fresh equivalent basis, or about a half week's average sales of fresh potatoes in the area.

By the end of the test the availability of potato flakes in stores was known to about 50 percent of the homemakers in the triple cities. The advertising and promotional campaign was confined to the first 4 weeks of the market test.

About 14 percent of all households in the market test area bought potato flakes at least once. A sizable proportion (30 percent) of nonbuyers gave reasons for not buying that permitted considering them as potential buyers.

About 60 percent of the homemakers who bought the product made repeat purchases. About half of the onetime buyers gave reasons that could be interpreted as meaning that they were potential repeat purchasers. It is estimated that repeat purchases of the product accounted for 7.6 pounds per household on a fresh potato equivalent basis during the 5-week test period.

The consumer survey data point to a strong positive reaction toward the product:

Nine in 10 homemakers who had bought the product expressed general satisfaction with potato flakes. Almost 8 in 10 homemakers reported that their families reacted favorably.

A similar proportion of homemakers were satisfied with its taste and texture in its reconstituted form.

Aside from taste and texture, homemakers were impressed with the product's convenience. A large proportion mentioned that it was easy to prepare and that it was a time saver.

Families having 4 or less members were more satisfied with the adequacy of servings per box of potato flakes than were large families (5 or more members). As a means of extending acceptability of the product, marketing a box containing 2 envelopes each holding 4 servings of the product is suggested.

Sales of processed potatoes, excluding flakes, increased 24 percent in the audit period over the premarket-test week; with flakes included, sales were 63 percent larger.

Potato flakes on either a case or fresh potato equivalent basis outsold all processed potato products except potato chips during the market test.

Consumer survey data indicate that 9 in 10 users of potato flakes and 8 in 10 nonusers might purchase the product if it becomes available on the market.

INTRODUCTION

Background

The general purpose of this research was to assess the potential market for potato flakes and appraise the extent to which this outlet might assist in expanding the market for potatoes.

The need for potato product innovations arises from the fact that for the past several decades potato producers have been losing consumer markets for their product. Illustrative of this situation has been the steadily declining per capita rate of potato consumption. With rising income levels, characteristic of the postwar period, people evidently have been able to afford the more expensive foods, such as meats and leafy green vegetables. In addition, higher incomes have accentuated a trend toward convenience foods which has further affected adversely the consumption of fresh potatoes.

The economic position of the potato industry has been further weakened during the postwar years by a continued high level of production. Despite drastic reduction in potato acreage, a phenomenal increase in average yield per acre--an increase from 122 bushels in 1939 to more than 250 bushels in 1955--coupled with an inelastic demand for potatoes has resulted in low prices to producers and supplies in excess of market requirements. This increase in yield was brought about by several factors, including the reduction of low yielding acreage, concentration of production on specialized potato farms, and improved cultural practices. 1/

1/ "Production Considerations in the 1956 Potato Outlook." Prepared for the 33d National Outlook Conference, November 28-December 1, 1955, by Fruit and Veg. Statis. Branch, Agr. Est. Div., Agr. Mktg. Serv., U. S. Dept. Agr. (out of print).

Trends in Potato Utilization

Farm disposition of the potato crop has changed drastically in the last several decades. As recently as 1940, only 67 percent of the crop was sold commercially. During the 5 most recent seasons, commercial sales have averaged close to 84 percent of the crop.

On the utilization side, also, there have been considerable changes. In 1940, only 5.4 million bushels, or about 2 percent of the potatoes going into food use, were processed. Most of this processed quantity went into manufacture of potato chips, while the remainder was used in hash, stews, soups, and potato flour. By 1956, according to preliminary estimates, the quantity processed for food had increased to about 65 million bushels, or approximately 22 percent of the quantity sold for food use. Of this amount, 45 million bushels were used for the manufacture of potato chips, 9 million for frozen french fries and other forms of prepared frozen foods, 6 million for dehydration, 3 million for potato flour, and a little over 2 million for other uses, such as canning, hash, stews, and soups. In 1940, processors of food purchased 1 bushel out of every 50 bushels sold by growers, whereas in 1956, they purchased 1 bushel out of every 5. 2/

Although consumers today are spending about the same proportion of their income for food compared to the prewar period 1935-39, the absolute amount of money being spent for food has increased substantially because of higher and better distributed consumer income. One factor contributing to this rise is that consumers are buying more services with their foods. This includes not only increased expenditures for foods as a result of more eating out in restaurants but also for more highly processed foods. 3/

Processed potato products can capitalize on increased expenditures for food, especially that part which is accounted for by the trend toward more processed convenient-to-use foods. The trend toward more processing is already under way in the potato industry with a greater proportion of fresh potatoes being utilized for processed potato products, such as frozen french fries, potato chips, and other forms of potato food products. In almost all instances, the processing has added to the cost of potatoes to consumers; yet these higher priced processed potato products have continued to sell at increasing volume in the last several years. Considering these factors, the role of dehydrated potatoes, as exemplified by the potato flake process, assumes greater importance. The potato flake process can assist the potato industry in maintaining or even increasing per capita sales by providing products which fit into an economy characterized by rising consumer incomes.

The Eastern Utilization Research and Development Division developed potato flakes--a new form of dehydrated mashed potatoes--with the expectation that such a convenience product for household use would help to expand markets

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2/ "U. S. Production, Utilization, and Use of Designated Potato Crop." Nat. Potato Council, 1956.

3/ "The Marketing and Transportation Situation," April 1956. Agr. Mktg. Serv., U. S. Dept. Agr. (out of print).

and extend the marketing season for potatoes. It is a product that fits into the postwar food trend for convenient food products for the housewife. It appears also to be a product of high quality. It has good flavor, appearance, and texture, which are the basic requirements for a good mashed potato. A market test of potato flakes was undertaken to determine its acceptance under actual market conditions.

Potato Flake Process

Developmental work on the potato flake process began during the summer of 1953 at the Eastern Utilization Research and Development Division of the Agricultural Research Service at Philadelphia, Pa. The Eastern Division was primarily interested in a dehydrated mashed potato product which would allow for the use of the lower-solids-content potatoes grown in Eastern and other areas. At that time, for the most part, only high-solids-content potatoes grown in the West were used by manufacturers of other forms of dehydrated mashed potatoes.

The potato flake process has some additional advantages over existing methods of producing dehydrated mashed potatoes. A primary advantage is that the product is dried to a 5-percent or lower moisture content in a single operation taking less than 30 seconds. This allows the potato mash to keep most of its delicate flavor characteristics. Another advantage is that the process is relatively simple compared to other dehydrating processes now in existence. The need for recirculation of partially dried product is eliminated. Less machinery is required and the equipment used in the process is readily available and in common use.

The process has several unique features which permit the use of many potato varieties for the production of a dehydrated mashed potato that can be reconstituted to the appearance of the fresh product. The proper mealy texture of a good mashed potato is obtained by precooking the raw potato slices in water at a temperature of about 165° F. for about 20 minutes before cooking them in steam. After precooking, the flakes from low-solids-content potatoes are able to absorb more water during reconstitution than flakes from nonprecooked potatoes of the same texture. The mash resulting from precooking the low-solids content potatoes resembles mash from a high-solids potato. Precooking evidently swells the potato cells enough to distend them and causes them to separate readily for mashing, producing a mealy mash. The precooking step is important in that it allows for not only the use of lower-solids-content potatoes, but also provides a method of controlling texture to suit the preference of the consumer. Another quality maintenance factor in the production of flakes requires that the rupture of starch cells in the mashing process be avoided. Breaking of starch cells during mashing releases starch and makes the mash gummy or pasty. This problem can be overcome by careful control of conditions on the drier to produce (1) a flake of desired density and thickness and (2) the proper sized flake. In addition, ricing instead of mashing the cooked potato slices and keeping cooking time to a minimum helps avoid a gummy or pasty mash. (Fig. 1

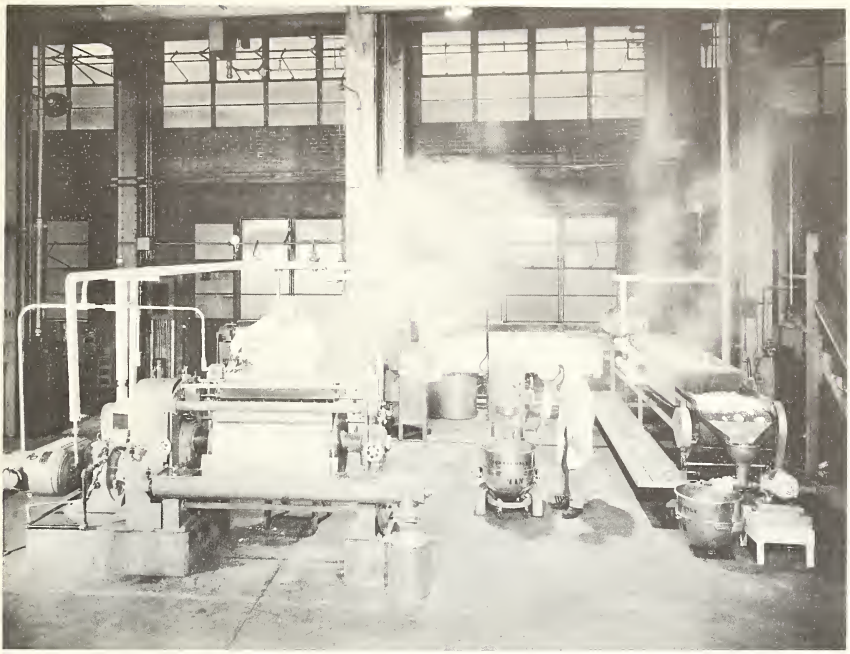

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Figure 1.--Overall view of the potato flake pilot plant at the Eastern Utilization and Development Division, Agricultural Research Service, U. S. Department of Agriculture. The potatoes are cooked as they move through the steam-heated cooking tunnel on a conveyor belt (right); then riced (right foreground). They are next mashed, stabilized and dried on a drum drier (left), and broken into flakes and collected in a receiving can (center foreground).

Cost data obtained from pilot-plant operations indicate that potato flakes can be made and packaged for retail distribution for about 11 to 14 cents for a package containing two 4-person servings. Prices vary according to the cost of raw potatoes. Raw potato cost per 100 pounds for these estimates varied from $0.60 to $1.68. The costs are based on a plant with 2 commercial size

single drum driers with drums 4 feet in diameter and 10 feet long which would produce from potatoes of 18½ percent solids, about 15,000 pounds of flakes per 24-hour operating day. 4/

The advantages of the potato flake process--the use of lower-solids-content potatoes, commonly used and readily available equipment, and resulting simplicity--should enhance the commercial feasibility of the process and the product. The product itself is reconstituted with ease and convenience. A cup and a half of boiling water mixed with a half cup of cold milk results in an ideal reconstitution temperature of about 180° F. This mixture is poured over the flakes, allowed to reconstitute for about a minute, and then whipped lightly with a fork. Potato flakes look attractive even during the reconstitution phase. This should increase the likelihood of favorable consumer acceptance of the product. (Fig. 2.)

TEST METHODS

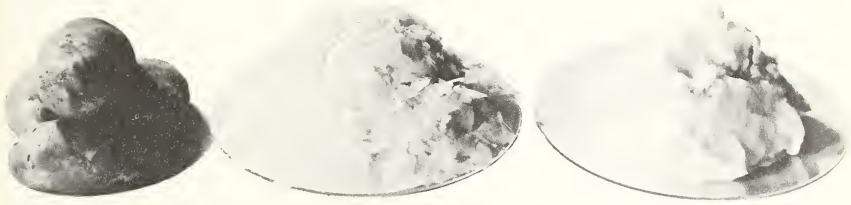
Selection and Characteristics of the Market Test Area

The test was conducted in the triple-cities area of Binghamton, Endicott, and Johnson City, N. Y., which has, according to the 1950 census, a combined population, including suburbs, of about 150,000. 5/ These 3 cities are located just above the Pennsylvania State line, approximately 190 miles northwest of New York City at the junction of the Chenango and Susquehanna Rivers. The cities were selected because they were at some distance from any large metropolitan area. This location was important because it allowed a more effective use of the limited promotional funds available.

In the market test area about half of the total labor force (77,300) is engaged in manufacturing. A substantial proportion of the labor force is in relatively high-wage industries, such as manufacture of business and electronic equipment. The other principal industry in the area is shoe manufacturing, which is a relatively lower paid industry. Average weekly earnings in all manufacturing were $74 in June 1956. Women constitute 29 percent of the total nonagricultural labor force.

4/ Cost data were obtained from the Eastern Utilization Research and Development Division publication, "Potato Flakes, A New Form of Dehydrated Mashed Potatoes. III. Estimated Commercial Cost." U. S. Dept. Agr., Agr. Res. Serv. Circ., ARS-73-12, April 1956. More detailed information on the technical aspects of potato flakes can be obtained from "Potato Flakes, A New Form of Dehydrated Mashed Potatoes. I. Pilot-Plant Process Using Double-Drum Drier." U. S. Dept. Agr., Agr. Res. Serv. Circ., ARS-73-2, November 1954, and "Potato Flakes, A New Form of Dehydrated Mashed Potatoes. II. Some Factors Influencing Texture." U. S. Dept. Agr., Agr. Res. Serv. Circ., ARS-73-9, August 1955.

5/ The Binghamton Press defines the area discussed (Binghamton, Endicott, and Johnson City) as the city ABC zone with an estimated population in 1956 of 151,348.



BN-3722

Figure 2.--Raw potatoes, potato flakes, and mashed potatoes.

The Binghamton area has shown a remarkable stability of employment, running at about 4 percent unemployment in the last 5 years. In recent months, this labor market has been reclassified to a B status of less than 3 percent unemployment. This, perhaps, makes the area a little different from other metropolitan centers in the Northeast where unemployment rates have been at higher levels, but it is in line with the level of unemployment for the country as a whole. 6/ The 1950 census reports that the median family income in the Binghamton area was $3,606 and the median school year completed was 9.9 years.

An investigation of the market under study showed that according to the 1950 census, 526 retail food stores, with sales at an annual rate of $46 million,

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6/ Labor Market Letter, New York State Department of Labor, Binghamton, N. Y., July 1956. New York State Commerce Review, "The Business Situation," New York State Department of Commerce, vol. 10, No. 6, Albany, N. Y., June 1956, p. 12. "Area Classification Summary" (advance release of Bimonthly Summary of Labor Market Developments in Major Areas) U. S. Dept. Labor, Bur. Employment Security, Washington, D. C., July 1956.

were located in the standard metropolitan area of Binghamton. The 1956 estimate by the Binghamton Press for the city ABC zone retail food sales show a rate of $47.4 million for approximately 339 stores.

Previous experience in market testing indicated that it was advantageous to confine activities for the most part to the large supermarkets. This was particularly true in the Binghamton area, since the large supermarkets--chain and independent--account for almost 85 percent of the retail food sales in the area. 7/ There were 41 such stores in the area, affiliated as follows: 6 large national and regional chains, a local chain, and 8 large independent supermarket Although the number of chains found in the Binghamton area increased the complexity of the work in terms of seeking cooperation and making arrangements for distributing the product, the situation has some long-term advantages for future commercial processors of potato flakes. Headquarters of all these chains--national, regional, and local--are aware of the test product and have seen and sampled it. (Fig. 3.)

Outline of the Test

Retail Store Audit

In the retail store audit, actual boxes, cases, and cans on display and in storage were counted at the beginning of the week and again one week later.

Sales for each week were obtained by adding deliveries to the beginning inventory and then subtracting from this total the ending inventory. The products audited were: Potato flakes, other dehydrated potato products, instant rice products, regular rice, potato chips, fresh potato salad, canned potato salad, canned whole white potatoes, frozen french fried potatoes, frozen potato puffs, frozen potato patties, frozen whipped potatoes, and fresh potatoes.

Twenty of the 41 sample stores were audited. Audits were made on Monday or Tuesday. Each audit store was visited the same day of the week and at approximately the same hour.

An audit of closely competing food products was undertaken before the actual market test got under way. This was done to provide the researchers with benchmark information as to the sales of competing products before the introduction of the test product in the market.

All sample supermarket stores (41) were supplied with the test product--State of Maine Potato Flakes--in the week preceding the test. The retail price was 15 cents per 4-serving box (fig. 4), or 2 packages for 29 cents. The retail pricing of the test product was set at a level commensurate with other instant-type potato products so that the effect of varying prices on the sales potential of the test product could be eliminated from the analysis. The price of the leading competitive product was 29 cents for an 8-serving package. In most instances, the size of display was the same and the location of the test product

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7/ Estimate by the Binghamton Press.

N-8553

Figure 3.--Example of supermarket used for retail audits in the Binghamton, N. Y., area.

was in the same general area as other instant-type potato products and canned vegetables. However, the spontaneous interest of local store managers in the product generated unscheduled special displays in a few stores.

Household Survey

A household survey was undertaken 6 weeks after introduction of the product on the market. The experimental market area was sampled on a probability basis to allow each household in Binghamton, Endicott, and Johnson City an equal chance of being contacted. In addition, households in suburban areas of the triple cities were included in the sampling. Households included in the sample were classified as (1) those who used the product (referred to in this report as "users"), (2) those who were aware of the product but did not use it (aware nonusers), and (3) those who were not aware of the product. The incidences of

PN-4178

Figure 4.--Retail package of potato flakes designed specifically for the market test.

awareness and unawareness were determined by asking all homemakers contacted several screening questions. The interview was discontinued at this point for respondents unaware of the product. The results shown for the consumer survey are based on 2,239 contacts with homemakers, of whom 294 were potato flake users, 832 were aware nonusers, and 1,113 were unaware of the product.

MARKET TEST RESULTS

Total Sales of Potato Flakes

A total of 894 cases of potato flakes, each case containing twenty-four 4-serving boxes, was sold during the 5-week market test period, virtually the entire supply available. These sales were made in 41 chain and independent supermarkets in the market test area. Sales of potato flakes during the test period averaged almost 5 cases per week per store.

Complete weekly audits were made of sales of potato flakes and competing products in 20 of the 41 stores stocking the product. Six of the 20 audit stores were used for in-store demonstrations.

Although sales of potato flakes in audit stores exceeded those in the non-audit stores, table 1 indicates that a primary factor in this situation was the in-store demonstrations. When the effect of demonstration on sales of potato flakes is removed, audit stores averaged a little more than 4 cases per week per store compared with the 3.4 cases in nonaudit stores. These unexpectedly high sales per store coupled with demonstration sales were primarily the reason a supply of the test product estimated to be sufficient for at least 10 weeks of market testing was sold in half that time.

Potato flakes, at the established retail price of 15 cents per 4-serving package, cost buyers of the product a little more than 11 cents per pound on a fresh potato equivalent basis (about 7 pounds of fresh potatoes yield 1 pound of flakes). Average prices for fresh potatoes ranged from 9.3 cents at the beginning of the market test period to 10.1 cents at the end of the test period. Normally a greater differential probably would exist between the fresh and processed products.

Sales in Sample Supermarkets

Audited sales of potato flakes in 20 of the 41 supermarkets stocking the test product were 609 cases for the 5-week period (table 1). As noted earlier, the heavy flake sales in audit stores were primarily due to the use of 6 of these stores for in-store demonstrations. When in-store demonstration effects are removed, weekly flake sales, for both audit and nonaudit stores, show a rising trend for the 5-week test period. The dropoff of sales in weeks 3 and 5 is accounted for in part by the Fourth of July holiday in week 3 and several stores having exhausted their supply of flakes prior to the weekend buying peak of the fifth and final week of the test period. This was verified by enumerators making store checks during that week. (Fig. 5, table 2.)

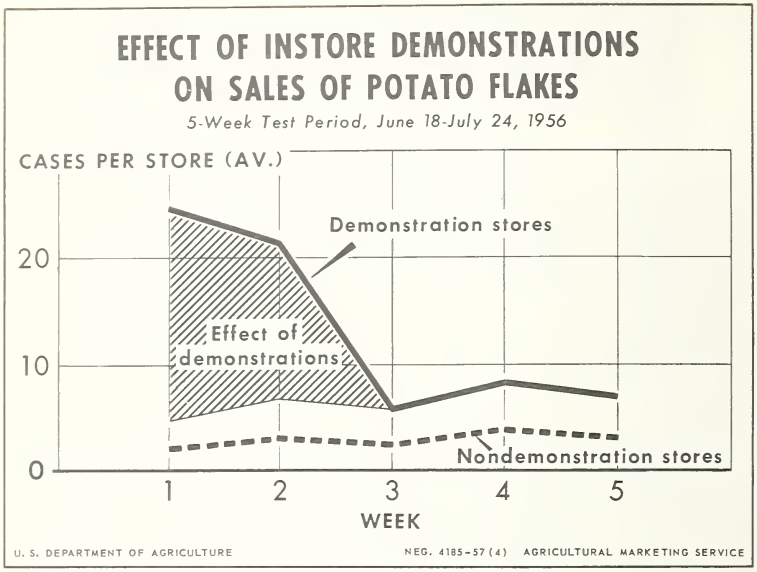

Figure 5

Promotional Campaign

During the first week of the potato flake test, a 4-week advertising and promotion campaign was launched by the Maine Potato Commission through its advertising agency. The program included the following: (1) 12 spot announcements over 2 local radio stations, plus 3 advertisements per week on a local program; (2) 1,500 lines of newspaper advertising in the 2 local newspapers twice a week for the first 2 weeks and once a week in 1 newspaper for the next 2 weeks; (3) six 1-minute advertisements for the first 2 weeks and three 1-minute advertisements for the next 2 weeks in 2 local television shows over the local and only television outlet in the area; (4) in-store display and point-of-sale material delivered and used in some of the stores; and (5) in-store demonstrations for 2 consecutive weekends in 6 stores. (Fig. 6.)

Fluffy Mashed Potatoes in 3 MINUTES!

(by actual test from package to table)

All you have to do is mix 1½ cups water and one-half teaspoon salt in a saucepan and bring to a boil. Remove the pan from the burner, add one-half cup cold milk.

Then pour contents over flakes, add one tablespoon butter and stir gently. Wait one minute, whip lightly and...

Presto... you have fluffy mashed potatoes that would take first prize at any county fair.

4 SERVINGS PER PACKAGE

2/29¢

Amazing-New-Easy POTATO FLAKES

BN-4179

Figure 6.--Newspaper advertising (1,600 lines) used in the promotion program.

How Consumers Became Aware of the Product

The major results of the survey show that among all homemakers contacted:

14 percent had purchased potato flakes
37 percent were aware of the product but had not purchased it
49 percent were unaware of the product

In order to determine the sources of awareness, homemakers were asked where or how they had heard about potato flakes.

73 percent mentioned newspapers, radio, television
62 percent saw the product in stores
43 percent were told about the product by someone
9 percent received a sample in the stores

When the aware homemakers were classified as to whether or not they also purchased and used the product, the users appeared to have been more exposed to the promotion and advertising campaign than were the aware-nonusers. More users than aware-nonusers stated (1) that they had learned about potato flakes from the major media--newspaper, radio, and television, (2) that they actually saw the product in stores, and (3) that they participated in an in-store demonstration by receiving a sample of the product. Both groups reported that they learned about potato flakes through a friend or neighbor to the same extent. (See table 3.)

In-Store Demonstrations

The shortness of the market test period did not allow for an assessment of the effect of the promotional campaign on the sales of potato flakes, since a comparable nonadvertising period could not be established. However, due to in-store demonstrations, the intensity of the promotional program varied considerab during the market test period. Through the use of the sales audit technique, it was possible to measure the apparent effect of this type of promotional activity upon sales of potato flakes. Audited sales of the test product clearly show the impact of in-store demonstrations upon sales of potato flakes. Demonstration sales held during the first 2 weekends of the promotional campaign accounted for 60 percent of the total sales in that period of the test product in the 20 audit stores. For the 5-week period, about a third of the audited flake sales were the result of in-store demonstration activities. (Table 1, fig. 7.)

Previous market test studies have indicated the importance of in-store demonstrations as a means of achieving a high initial rate of sale. In market testing frozen grapefruit sections, a 4 to 1 sales ratio favoring demonstration stores was found during the 4-week promotion period. 8/ For the potato flake

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8/ Branson, Robert E., Jacobs, Milton, and Hall, Richard. "Frozen Grapefruit Sections: Evaluating A New Product By Retail Sales Audit and Household Survey." Mktg. Res. Rep. No 110, 62 pp., illus. U. S. Dept. Agr. Washington, D. C., Dec. 1955, p. 9.

M-8549

Figure 7.--In-store demonstration of potato flakes.

test, demonstration stores outsold nondemonstration stores at a sales ratio of better than 5 to 1. (Table 2.) Some of the difference between these sales ratios may be attributed to the different types of products involved in each of the market tests. The in-store demonstration technique is a particularly effective means of introducing a dehydrated product such as potato flakes, as offering a high quality product with a good fresh flavor for sample helps overcome unfortunate experiences with and consequent resistance to a dehydrated product which some people may have had previously. Firsthand observations of favorable reactions by customers when tasting the product for the first time during in-store demonstrations underscore the advantage of taste-exposure to a product with a none-too-good past consumer experience.

The in-store demonstration technique proved to be a powerful stimulant to sales of potato flakes as well as setting up more quickly a repeat purchase pattern among initial buyers of potato flakes. This is borne out by a more detailed analysis of the sales audit data. During the 2 demonstration weeks, sales of potato flakes averaged 8.8 cases per audit store, but with the 6 demonstration stores sales averaged about 23 cases per store. For the last 3 weeks

of the test period, audit store sales averaged 4.3 cases of potato flakes with demonstration stores outselling nondemonstration stores at a sales ratio of a little better than 2 to 1. Since the ratio based on annual dollar sales volume of demonstration versus nondemonstration stores is only 1.36 in favor of demonstration stores, the higher ratio of 2 to 1, found in the last 3 weeks for demonstration stores, indicates to some degree the carryover effect of the in-store demonstration technique on sales of the test product. (Tables 1 and 2.)

Another noteworthy item is that the dropoff of one-half in sales from the demonstration period to the nondemonstration period was relatively low compared to previous market tests where sales after demonstrations dropped to one-seventh or one-eighth of the demonstration period volume. This difference can be attributed in great part to the frequent repeat purchases of potato flakes at an earlier than usual stage of the market test period.

Purchase Pattern

The impact of the overall promotional program has been assessed by the fact that 50 percent of the homemakers indicated their awareness of the product. A further means of assessing the promotion is determining the proportion of homemakers in the triple-cities area who purchased the product. The consumer survey data show that about 14 percent of all homemakers had bought the product during the market test period. Previous successful market test studies report about the same incidence of buying a new product as was found for potato flakes. (Table 4.)

Those homemakers who were aware but who had not purchased potato flakes (37 percent of all homemakers contacted) were asked: "How does it happen that you did not buy any potato flakes?" Their reasons for not buying were grouped according to the indicated possibility of future purchases by the homemaker as follows:

Replies	Percent
Homemakers giving reasons indicating possible future purchase	32
Reasons:	
Could not find them in the store	14
Just did not remember	7
Did not have time to buy them	5
Not cooking at home (seasonal)	3
Just recently heard about them	2
Intend to get some in the future	1
Homemakers giving reasons indicating unlikelihood of future purchase	48
Reasons 1/:	
Prefer Irish (regular, fresh) potatoes	8
Prefer to fix potatoes myself	5
Don't like packaged or prepared products	9
Don't like dehydrated products	2
Don't like new, fancy things	2

Continued--

Replies--Continued	Percent
Don't use potatoes very often	10
Don't use--on diet	1
Don't like potatoes	1
Didn't think I would like them, don't like them	7
Too expensive	3
Prefer potatoes fixed other than mashed	2
Just not interested	1
Raise our own potatoes	1
Miscellaneous	1
Homemakers giving ambiguous reasons regarding future purchase	14
Not ascertained, don't know	6
Total	100
Number of cases	278

1/ Percentages of reasons add to more than percentages of homemakers because some homemakers gave more than 1 reason.

On the basis of the reasons given for nonuse, about a third of the aware homemakers who did not buy the product may be considered potential purchasers. They did not seem to dislike the product; instead their major reasons for not buying potato flakes dealt with unavailability of the product in the stores, failure to remember to buy them or not having the time to buy them. Homemakers giving such reasons could probably be encouraged into the market.

About one-half of the aware-nonusers gave reasons for not buying, such as infrequent use of potatoes, disliking packaged or prepared products, and preferring Irish (regular, fresh) potatoes. These reasons have been interpreted as substantially negative and suggest that these homemakers are unlikely to purchase the product in the future.

Repeat Purchases

A good measure of the success of a new product is whether or not it continues to be purchased by consumers. Rather than accepting only the measure of high initial sales as meaning that the introduction of the new product has been satisfactory and that consumers have accepted the product, an examination of the extent of repeat purchases was made. Homemakers were asked how many times they had purchased potato flakes in the past 2 months.

Of the 305 homemakers in the household sample who purchased potato flakes, 38 percent made only one purchase, 24 percent made two purchases, 13 percent

made three purchases, and 23 percent made four or more purchases. 9/ Overall, 62 percent of the homemakers had made more than one purchase, while 38 percent had made only one purchase.

Those homemakers who made only one purchase of potato flakes were asked: "How does it happen that you only bought some once?" Their reasons follow:

Replies	Percent
Homemakers giving reasons that indicate possible future repeat purchase	51
Reasons 1/:	
Unavailable--have not seen them lately	13
Still have potato flakes on hand	10
Have not used flakes purchased as yet	10
Just didn't think about it	7
Have not shopped lately	5
Had fresh potatoes on hand	5
Had just heard about them	4
Homemakers giving reasons that indicate unlikelihood of future repeat purchase	31
Reasons 1/:	
Didn't like them	28
Don't eat many potatoes	8
Prefer fresh potatoes	4
Just wanted to try them	3
Too expensive	3
Miscellaneous	3
Not ascertained, don't know	15
Total	100
Number of cases	115

1/ Percentages of reasons add to more than percentages of homemakers since some homemakers gave more than 1 reason.

About half of the homemakers who had made only one purchase gave reasons which may be interpreted as meaning that they were likely to purchase the product again. However, about 3 out of 10 of the onetime purchasers gave reasons that indicated that making another purchase of potato flakes would be unlikely.

Analysis of the personal characteristics of homemakers who made one purchase as compared to homemakers who made two or more purchases indicates that younger homemakers (under 44 years of age) were somewhat more likely to be repeat purchasers than were the older homemakers (45 years and older). Those of middle

9/ The difference between the 294 users reported earlier and the 305 purchasers reported here is due to 11 homemakers who purchased the product but had not used it by the time they were interviewed. Except for data on purchases these homemakers are considered as aware-nonusers throughout the report.

and high incomes tended to be more likely repeat purchasers than were homemakers in the low-income range. Homemakers having families of 3 to 4 persons were more likely repeat purchasers than were those having smaller or larger families. (Table 5.)

Homemakers' Opinions About Potato Flakes

Homemakers who purchased and used potato flakes were asked about various attributes of the product, and its package. Questions covered general satisfaction, taste, texture, and temperature of the product when prepared and when served, and satisfaction with box size and instructions.

General Satisfaction With Potato Flakes

Almost 9 in 10 users were generally satisfied with potato flakes. When general satisfaction is related to personal characteristics of homemakers, it appears that (1) more homemakers over 35 years were satisfied than were younger homemakers (under 35 years of age), (2) more homemakers with grammar and high school education were satisfied than were homemakers having college education, and (3) more homemakers having families of 3 to 4 persons were satisfied than were homemakers having smaller or larger families. (Table 6.)

On the assumption that success of a new product depends to a considerable extent on general family acceptance, homemakers were asked: "How do members of your family feel about potato flakes?"

Replies	Percent
Stated positive family reaction	78
Stated negative family reaction	14
Not ascertained, don't know	8
Total	100
Number of cases	294

Satisfaction With Taste of Potato Flakes

Better than 8 in 10 homemakers who used the product reported that they liked its taste.

Further analysis of satisfaction or dissatisfaction with taste by personal characteristics of homemakers indicates that (1) homemakers 35 years of age and older appeared to like the taste of the product more than did young homemakers, and (2) more homemakers having grammar school and high school education liked its taste than homemakers having college education. (Table 7.)

Homemakers who liked the taste of potato flakes were asked: "What was it that you liked about the taste of potato flakes?" and "Was there anything about the taste of the product that you disliked?"

Taste attributes liked:	Percent 1/
Tastes like good (new, fresh, real, regular) potatoes	68
Tastes good	19
Creamy	6
Better flavor, smooth flavor	4
Sweet	2
Specific characteristics (mealy, nice quality, children like)	5
Not ascertained, don't know	7
Taste attributes disliked:	
Imitation taste, not fresh not like real potatoes	2
Dislike specific taste characteristics (flat, evaporated milk, burnt milky, dehydrated)	6
Not ascertained, don't know	2
Number of cases 2/	251

1/ Percentages add to more than 100 because some respondents gave more than 1 response.

2/ 39 homemakers stated that they disliked the taste and 4 did not give a response to the question: "Did you like the taste of potato flakes?"

Homemakers' opinions concerning taste of potato flakes can be summed up as follows:

The major positive attribute is that respondents who liked its taste considered that the product tasted like fresh potatoes; the negative attributes reported by small numbers of "likers" were that it had an imitation taste, an evaporated milk taste, a flat taste, etc.

Only a relatively small proportion of homemakers disliked the taste of potato flakes. The major negative attributes reported by these few were a dislike of the taste in general, a dislike of the imitation taste, and dislike of the flat taste of the product.

Homemakers' Opinions About Factors Other Than Taste

Respondents who used the product were asked, "Other than taste, what were the things that you liked about potato flakes?" and "Other than taste, what were the things that you disliked about potato flakes?"

Replies	Percent 1/
Attributes liked:	
Convenience	
Easy preparation, easy to fix	56
Time saver, fast to fix	49
Convenience - general	6
Needs little storage space	4
Good in emergency	2
Easy to carry home, easy to shop for	1
Economy	
Economy - general	10
No waste	2
Texture	
Smoothness	4
Fluffy	4
Texture - general	2
Appearance	
Appearance - general	4
Looks white and creamy	3
Looks nice and fluffy	2
Attributes disliked:	
Texture	
Not light and fluffy	4
Sticky, gluey, pasty	2
Soggy	2
Specific dislikes (dry, watery, mealy)	5
Appearance	
Too dark in color	3
Appearance - general	1
Odor	
Odor - general	1
Preparation	
Preparation - general	1
Not ascertained, don't know	2
Number of cases	294

1/ Percentages add to more than 100 because some homemakers gave more than 1 response.

The most important attributes, other than taste, liked by the homemakers had to do with convenience of the product. The most important negative attributes, although of much smaller magnitudes than attributes liked, concerned the texture and appearance of potato flakes.

Instructions and Reconstitution

A major problem for many pre-prepared products is that of reconstitution. What may seem quite straight-forward and simple to technicians in preparing a product may be difficult for most homemakers. The instructions for preparing potato flakes need to be followed in order to come up with a product which is palatable and which has a good appearance. For these reasons, homemakers were asked questions about the reconstitution of the product.

Almost all users reported following the instructions on the box and most homemakers found them easy to follow.

As they were instructed on the box, most used a measuring cup in preparing the product.

Over half used gravy on the whipped or mashed potatoes made from potato flakes.

Most were satisfied with the temperature of the product after preparation and were satisfied with the temperature of the product when served.

Almost all were satisfied with the texture of the product.

Those homemakers who were not satisfied with texture primarily complained about heaviness, rubbery consistency, lumpiness and dryness.

As far as following instructions for reconstitution of potato flakes, there seemed to be considerable satisfaction with the way the product was made and with the final result. However, possibly some dissatisfaction with the texture may be attributed to the way homemakers reconstituted the product despite the fact that most of them reported following the instructions.

Box Size and Adequacy

Concerning box size of the product, users were asked whether this was a good size for their families. Most homemakers found the size adequate. Of the small group that found the box size unsatisfactory, most preferred a larger size. By analyzing satisfaction with size of family of the homemaker respondent, it was found that homemakers having families of 5 or more persons were least satisfied with the box size. (Table 8.) Since the size of the test package was designed to make 4 servings of the product, the relatively greater satisfaction by families of 4 persons or less was to be expected.

About half of the homemakers were obtaining 4 servings from one package of potato flakes. About one-fifth were getting 5 or more servings per package.

Number of servings	Percent
Two or less	6
Three	13
Four	52
Five	13
Six or more	9
Not ascertained, don't know	7
Total	100
Number of cases	294

Potato Flakes and Competing Products

A key factor in the appraisal of the commercial possibilities of a new product is its relationship to closely competing products. An analysis of these relationships can provide valuable information to potential processors of the new product and to agricultural producers. The sales potential of a new product can be more readily assessed when answers are forthcoming to such questions as: What part of the total market of a particular commodity group can be attributed to the new product? What is the sales position of the new product relative to established products of a closely competing nature? What is the substitution effect of the new product on closely competing established products? In this study, the sales audit and consumer survey techniques were used to provide the research data needed to answer the questions posed above.

Household Use Patterns of Potatoes and Potato Products

In order to describe more fully why some homemakers purchased and used potato flakes and others did not, data as to use and frequency of serving fresh potatoes were obtained.

There was no apparent difference in the frequency of use of Irish potatoes in the preceding 2 months between the homemakers who used potato flakes and those who had not used the product. (Table 9.)

Almost all homemakers reported that they served Irish potatoes most often for the evening meal. The serving of Irish potatoes for the noon meal was reported by about 4 percent of the homemakers; having Irish potatoes for breakfast was negligible. One inference which can be drawn from this pattern is that there may be possibilities for increasing potato use for the noon meal by way of a "quick, easy to prepare" product like potato flakes. A well-conceived promotion and advertising program aimed at developing potato flakes as a noon meal vegetable may therefore be a good possibility. This suggestion is based on the premise that potatoes are a popular vegetable and their infrequent use for noon meals may be tied in with the fact that housewives usually spend less time preparing the noon meal than the evening meal. (Table 10.)

As for the preferred ways of fixing Irish potatoes, more homemakers who used potato flakes preferred mashed potatoes than the nonuser homemakers. For both groups mashed potatoes was the most preferred way of fixing potatoes. (Table 11.)

Concerning other potato products, frozen french fries were used by more homemakers who had used potato flakes than by homemakers who had not. However, about twice as many users of potato flakes had used instant or dehydrated potatoes in the preceding 2 months as compared to nonusers of potato flakes. Generally, more homemakers who used potato flakes appeared to use other prepared potato products than homemakers who had not used potato flakes. (Table 12.)

Households using potato flakes can be characterized as preferring potatoes as mashed, preparing potatoes more often as mashed, and more apt to be buyers of processed potato products, especially other forms of dehydrated potato products than those households not using potato flakes.

In addition to their use patterns of potatoes and potato products, homemakers were asked to give their preferences (1) between potato flakes and Irish potatoes and (2) between potato flakes and other instant or dehydrated potatoes that they had used.

Potato flakes were preferred over Irish potatoes for making mashed or whipped potatoes by 5 in 10 homemakers who used both potato flakes and Irish potatoes; 4 in 10 preferred Irish potatoes; and 1 in 10 had no preference. (Table 13.) Convenience was the main reason given by homemakers preferring potato flakes for this purpose, while taste was the major reason given by homemakers preferring Irish potatoes.

Comparisons Based on Sales Audit Data

A comparison of sales of fresh potatoes and other potato products between 2 time periods, one, a benchmark period a month prior to the market test, the other, the market test period itself, was made to determine the substitution effect, if any, of potato flakes during the market test period. These sales data also can be used as a rough indication of the effect of rising prices, prevalent during the market test period, on sales of these products. In addition, the consumer survey included questions on substitution effect and price.

For ease of comparison, all products are converted to a fresh potato equivalent basis. These comparisons are based on audited sales data obtained from 20 sample supermarkets during each period in the market test area.

Audited sales of all potatoes, fresh and processed, during the market test period show an increase over the benchmark sales established a month earlier despite the introduction of potato flakes and prevailing higher prices for fresh and processed potato products. Processed potato products with flake sales removed show an increase in sales of 24 percent over the premarket test week. When potato flake sales are included, sales of processed potato products increas

63 percent over the benchmark period. Similarly, fresh potatoes show an 8-percent increase in sales between the 2 periods. For all products--fresh and processed, including flakes--the overall increase between the 2 periods is 16 percent. The relatively greater increase of processed potato sales, especially potato chips, during the summer months follows the general seasonal pattern for potatoes.

During the market test period, potato flake sales on a fresh potato equivalent basis accounted for a little over 5 percent of the total sales for all potato products sold. Potato flake sales accounted for a much higher proportion--31.6 percent--of the total sales for all major processed potato products during the market test period. On a fresh potato equivalent basis, the 28,000 pounds--represented by flakes--accounted for a half week's sales of fresh potatoes during the market test period. (Table 14, fig. 8.)

The pattern revealed by an analysis of audited sales data appears to be that the introduction of potato flake sales and rising prices did not adversely affect sales of fresh potatoes and other processed potato products. The substantial increase in sales of all potatoes, particularly processed potato products during the market test period, seems to rule out potato flakes as a substitute for other potato products. Market data on sales of fresh and processed potato products were not available for previous years, thus no absolute measure of the extent of substitution was possible. On the other hand, the consumer survey reveals some indication of what the long run situation may be as it concerns the substitution effect of potato flakes.

As an indication as to whether potato flake purchases were substitutions for Irish potatoes or were purchased in addition to Irish potatoes, homemakers who used potato flakes were asked: "When you used potato flakes, what were you substituting them for?"

Replies	Percent 1/
Irish potatoes	88
Cereal pastes (noodles, macaroni, spaghetti)	9
Nothing	7
Rice	6
Starches	2
Miscellaneous	1
Not ascertained, don't know	2
Number of cases	294

1/ Percentages add to more than 100 because some homemakers gave more than 1 response.

Most homemakers were substituting potato flakes for Irish potatoes. Mainly, potato flakes would substitute for potatoes in the mashed form and not in the many other ways in which fresh potatoes may be prepared. In addition, 7 percent

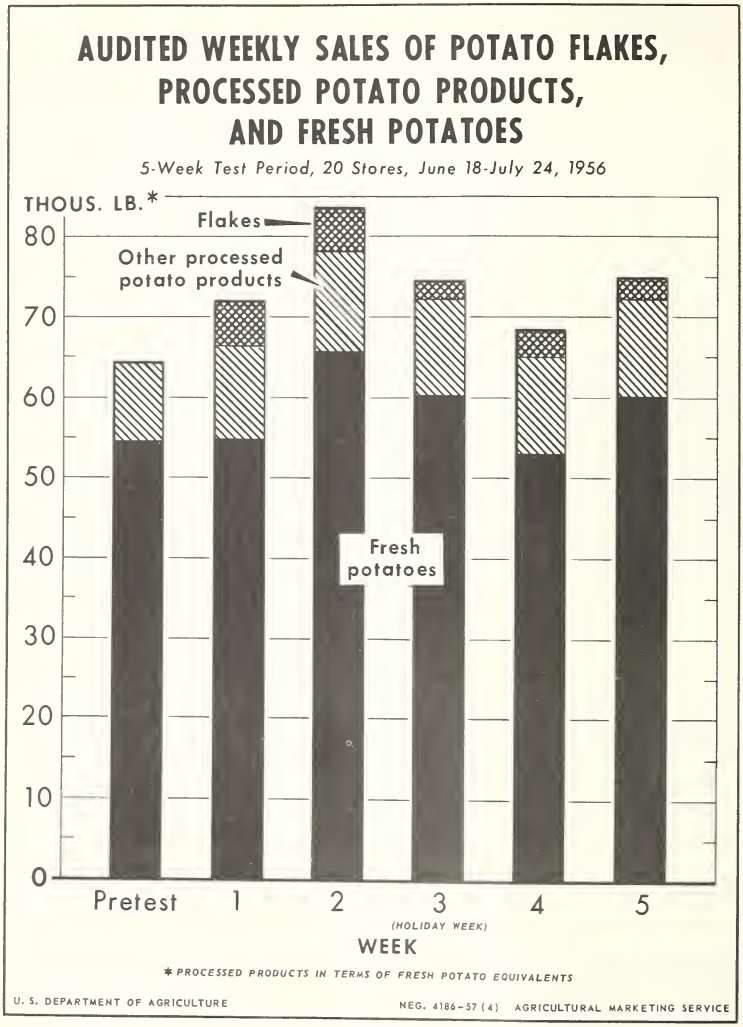
AUDITED WEEKLY SALES OF POTATO FLAKES, PROCESSED POTATO PRODUCTS, AND FRESH POTATOES
5-Week Test Period, 20 Stores, June 18-July 24, 1956
THOUS. LB.*
Flakes
Other processed potato products
Fresh potatoes
80
70
60
50
40
30
20
10
0
Pretest
1
2
3
4
5
(HOLIDAY WEEK)
WEEK
* PROCESSED PRODUCTS IN TERMS OF FRESH POTATO EQUIVALENTS
U. S. DEPARTMENT OF AGRICULTURE
NEG. 4186-57 (4) AGRICULTURAL MARKETING SERVICE

Figure 8

of the homemakers stated that the new product was not purchased as a substitute at all. While the substitution effect reported by consumers was not reflected by the sales audit data, it must be also remembered that only 14 percent of the population bought potato flakes during the market test. It is likely that as the proportion of homemakers buying potato flakes or similar products increases, the stated substitution effect may be greater on fresh potato sales than presently shown by sales audit data.

Product by Product Comparisons

Sales of all major potato products, processed and fresh, were audited to determine the relative sales position of the test product in the market test area. Sales data for competing products and the test product were related to size of retail outlet on the basis of annual dollar volume, average sales per store, sales per 100 customers, and price relationships among the audited products.

Actual sales of potato flakes are used in the comparisons with other competing products, since a satisfactory method of adjusting sales to eliminate the effects of the promotional campaign for potato flakes was not practicable. Although no other potato product received as intensive promotional treatment as potato flakes during the 5-week period, a limited amount of promotional activity was observed for several of the other audited potato products, notably, frozen french fries, potato chips, and canned whole white potatoes, usually in the form of weekend specials. Undoubtedly, the promotional campaign for potato flakes fostered an increased awareness of other potato products and probably had a beneficial effect on the sales of these products.

Sales Ratios

Potato flakes, on either a case or fresh potato equivalent basis, outsold all processed potato products with the exception of potato chips. Of these processed potato products outsold by potato flakes, only frozen french fries--an acknowledged leader in frozen vegetable sales--came close (a ratio of 1.3 to 1 in favor of potato flakes) to the sales volume position of potato flakes during the market test period. When sales of frozen french fries are excluded, potato flake sales were greater than the combined total of all other frozen, canned, and dehydrated potato products carried in the 20 sample supermarkets in the market test area. On the other hand, fresh potatoes far outsold potato flakes. On a fresh equivalent basis, the sales ratio was about 15 pounds of fresh potatoes to 1 pound of potatoes in the form of flakes. Other processed potato products, including potato chips, also were outsold by fresh potatoes in most instances by as great or greater margins. (Table 15, fig. 9.)

Dollar Volume

A similar situation was found when comparing the total dollar value on a retail price basis of potato flakes and other closely competing potato products. Here again only 2 products--fresh potatoes and potato chips--show a greater dollar sales volume during the 5-week market test period than potato flakes. (Table 15.)

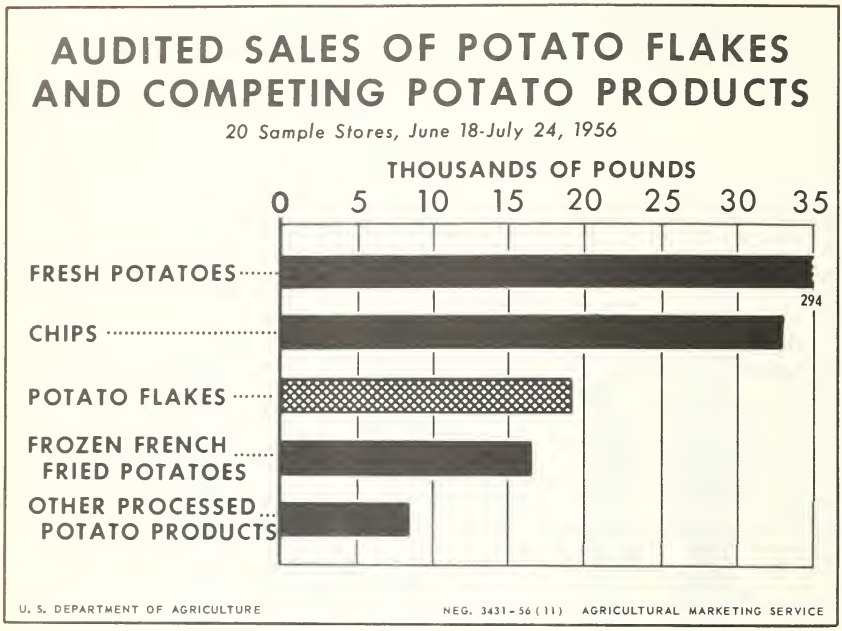

Figure 9

Sales Patterns

When the sales rates of fresh potatoes and other potato products are charted, the sales pattern for these products becomes more readily apparent. Potatoes and potato products align themselves into 3 sales classifications (fig. 10). In the lowest sales classification are found canned whole white potatoes and fresh potato salad. Not shown but also in this same class would be a combination of several frozen potato products other than frozen french fried potatoes. In the middle category are frozen french fried potatoes, potato flakes, and possibly potato chips, although potato chip sales were considerably higher during the 5-week test period. It is expected that potato chip sales would fall into the middle category after its seasonal peak--the summer months--had passed. At the top, clearly by themselves, are fresh potatoes. No processed potato product approaches the sales volume of fresh potatoes.

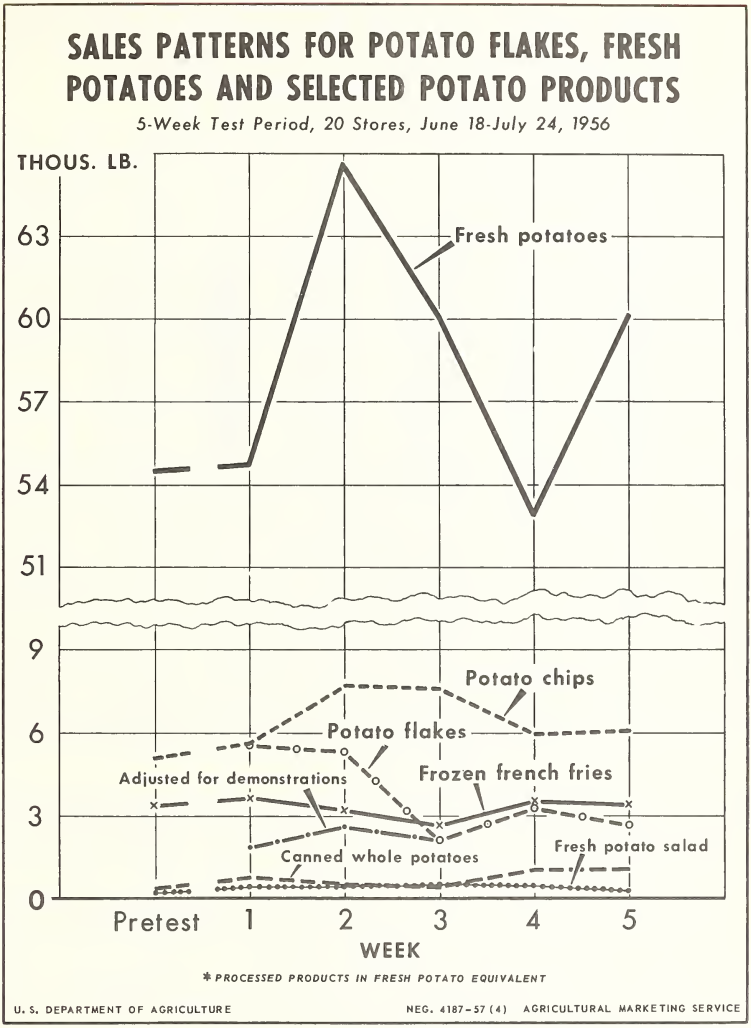
SALES PATTERNS FOR POTATO FLAKES, FRESH POTATOES AND SELECTED POTATO PRODUCTS
5-Week Test Period, 20 Stores, June 18-July 24, 1956
THOUS. LB.
63
60
57
54
51
9
6
3
0
Fresh potatoes
Potato chips
Potato flakes
Adjusted for demonstrations
Frozen french fries
Canned whole potatoes
Fresh potato salad
Pretest
1
2
3
4
5
WEEK
* PROCESSED PRODUCTS IN FRESH POTATO EQUIVALENT
U. S. DEPARTMENT OF AGRICULTURE
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Figure 10

Although it must be remembered that these data are from one market and for only a relatively short period of time, the strong position of potato flakes in relation to other processed potato products as indicated by sales ratios, dollar volume, and sales pattern points to the likelihood of commercial adoption of potato flakes.

Customer Count Relationships

Customer count information was obtained from each of the audit stores. These data were related to sales of the various potato products being audited and converted to a sales per 100 customers classification. Such data allow for an appraisal of the effect of customer traffic on unit sales of the new product. However, sales per 100 customers as a yardstick had limited usefulness in this market test because of the short market test period, attendant promotional campaign, and the use of only large volume outlets in the sample. Table 16 shows that potato flakes outranked all potato products in unit sales per 100 customers with the exception of fresh potatoes. An inference that can be drawn from the customer count data is that sales of potato flakes tended to be more often a multi- rather than a single-unit transaction.

Price Relationships

Rising prices for fresh potatoes with the price of potato flakes held constant undoubtedly made the sales position of potato flakes relatively more favorable during the market test period. 10/ The fresh potato situation in the triple-cities area followed quite closely the national pattern of short supplies and rising prices, culminating in a record peak about mid-July. This is the familiar classical picture of the effect of a short supply on a commodity with an inelastic demand. The audit data indicate that weekly fresh potato sales were higher during the 5-week test period than during the pretest week a month earlier (fig. 11). Sales of fresh potatoes in the 20 audit stores during the pretest week averaged a little more than 54,000 pounds. The average for the 5-week test period was almost 59,000 pounds of fresh potatoes. (Table 14.) This increase occurred during hot weather months when purchases of fresh potatoes normally fall off with the slack usually taken up by processed potato products, such as potato chips, frozen french fries, etc.

An important consideration in the interpretation of the fresh potato sales and price data is the relatively short period involved. The increase in fresh potato sales that did occur may have been due to other factors. For example,

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10/ Consumer response to relative prices of potato flakes and Irish potatoes--When homemakers who used potato flakes were asked: "How would you say that the price of 1 box of potato flakes compared to the price of Irish potatoes needed for 4 servings of mashed potatoes?" More than half of the users who knew the price of potato flakes replied that "potato flakes are cheaper now." Only 12 percent said that "Irish potatoes are cheaper now" and about 13 percent thought the prices were "about the same."

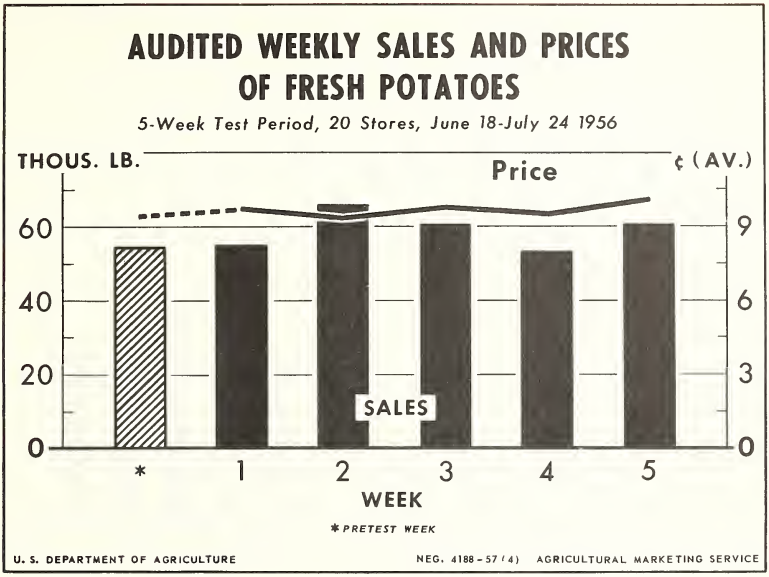

Figure 11

the promotional campaign for potato flakes during the market test period may have had some effect in stimulating the sales of fresh potatoes and other potato products. In any event, the introduction of potato flakes in the market did not adversely affect the sales of fresh potatoes.

Similarly, audit data concerning sales of selected processed potato products during the 2 periods show for the most part rising sales. However, a dropoff in sales of potato chips occurred in the last 2 weeks of the market test period during a time when prices for this product reached a peak. The response of sales to price for frozen french fries and canned whole white potatoes is somewhat obscured by the fact that weekend specials occurred in stores where these product were sold (fig. 12).

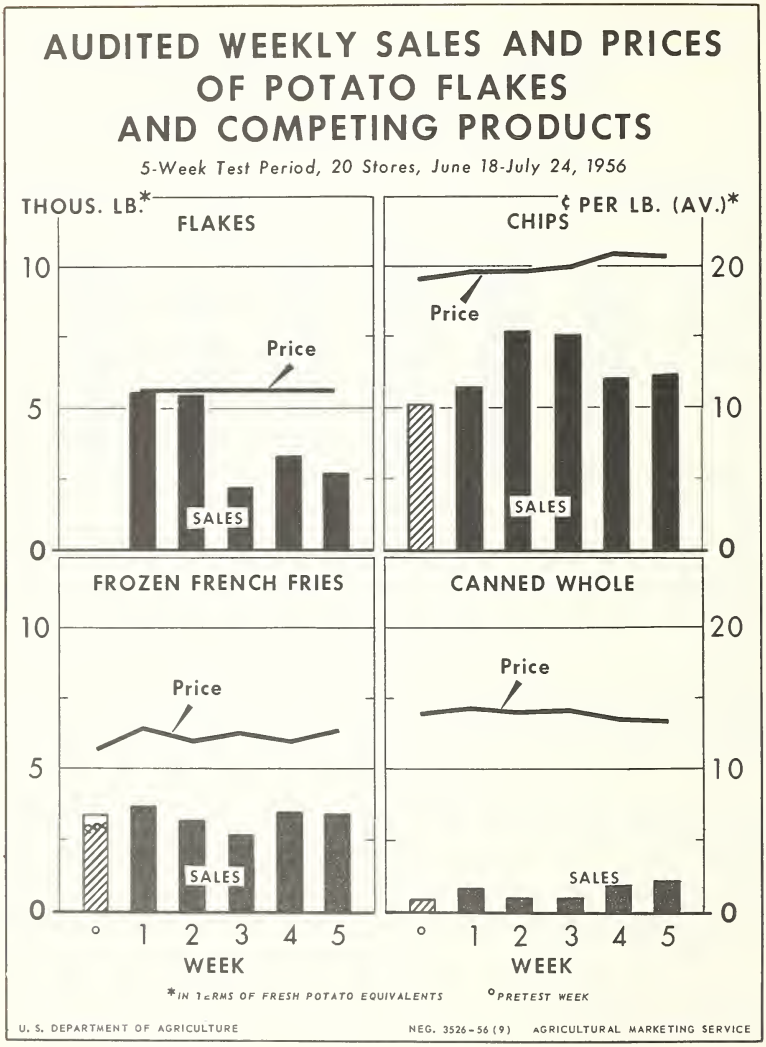
AUDITED WEEKLY SALES AND PRICES
OF POTATO FLAKES
AND COMPETING PRODUCTS
5-Week Test Period, 20 Stores, June 18-July 24, 1956
THOUS. LB.*
FLAKES
¢ PER LB. (AV.)*
CHIPS
Price
SALES
FROZEN FRENCH FRIES
CANNED WHOLE
10
5
0
20
WEEK
0 1 2 3 4 5
*IN TERMS OF FRESH POTATO EQUIVALENTS
°PRETEST WEEK
U. S. DEPARTMENT OF AGRICULTURE
NEG. 3526-56 (9)
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Figure 12

AN ASSESSMENT: MARKET TEST FACTORS AND PRODUCT POTENTIAL

Market Test Factors

Several qualifying factors must be kept in mind for a realistic appraisal of the sales potential of potato flakes. An earlier publication dealing with some preliminary findings of this market test stated, in effect, that such factors as the shortness of the market test period, unusually high prices for fresh potatoes, etc., resulted in a more favorable sales position for potato flakes than would otherwise have been the case. 11/ A reappraisal of this statement based on additional analyses of the data confirms only in part the above conclusion. Counterbalancing influences offset in many instances the favorable effect of these "outside" factors on sales of potato flakes. Since the net effect of these market test conditions is to make the favorable results found for potato flakes subject to more speculation than would otherwise be the case, a more detailed discussion of the various factors is warranted.

Among the several factors limiting the usefulness of the market test research findings, probably a primary one is the short market test period. The market test had been scheduled for a minimum of 10 weeks. The abbreviated market test period of 5 weeks resulted from an extremely high rate of initial purchases, induced in large part by in-store demonstration sales, and a remarkably high proportion of initial buyers, considering the short time period, making frequent repeat purchases of potato flakes.

From a research standpoint, a short market test period makes for inconclusive results. This is usually the case for food product innovations, since a market test period of several months serves to eliminate the novelty or impulse purchase effects induced by promotional activities as well as allowing sufficient time for the formation of a reliable repeat purchase pattern. This generalization, particularly in regard to repeat purchases, does not appear to hold for potato flakes. Almost a third of the repeat buyers of potato flakes made 4 or more purchases of the product during the 5-week period. This indicates that a repeat purchase pattern for flakes was more quickly established than is usually the case. In addition, the reasons given by a considerable proportion of the onetime buyers of the product for not making additional purchases reflected the actual situation that the product was not available on grocer shelves.

A factor enhancing the favorable sales position of potato flakes was the promotional campaign for potato flakes carried on during 4 of the 5 weeks of the market test period. A promotional campaign under normal circumstances maximizes the sales position of a new product relative to other competing products. However, the question raised was whether or not the promotional campaign taken in conjunction with the short market test period would unduly affect

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11/ "Market Testing Potato Flakes--A New Form of Dehydrated Mashed Potatoes," a paper presented at a meeting sponsored by the Maine Potato Commission at Houlton, Maine, by Philip B. Dwoskin and Milton Jacobs, October 16, 1956, Agr. Mktg. Serv., U. S. Dept. Agr.

potato flake sales relative to sales of other products. In this respect it should be pointed out that the shortness of the test did not permit nearly the extent of consumer awareness of the availability of potato flakes as exists for established potato products. This tends to minimize to some degree the special benefits of the promotional campaign for potato flakes.

In view of the above situation, the short market test period assumes greater importance in as much as the sales position of potato flakes was achieved within a situation of relatively low consumer awareness of their availability. This assumption is based on the proposition that an advertising campaign has a carry-over effect. The shortness of the market test period eliminated for the most part these "beneficial effects" which may have increased awareness of the product among the unaware households.

Another factor, of considerable importance to the sales position of potato flakes, is the record high prices for fresh potatoes during the summer of 1956. Although fresh potato prices hit their record peak after the market test had ended, weekly prices for fresh potatoes averaged 9.3 cents per pound at the beginning of the test period and 10.1 cents at the end of the 5-week period. On an equivalent basis, potato flakes sold for 11 cents a pound, making them almost as economical as fresh potatoes. However, during this period of rising prices, audited sales of fresh potatoes and other potato products trended upward and were higher than the benchmark data established by a premarket test audit a month prior to the introduction of potato flakes on the market. Moreover, the assumption that consumers would substitute potato flakes for fresh potatoes because of the price situation is somewhat weakened by the fact that potato flakes as a substitute for fresh potatoes can be used, in most instances, only as mashed potatoes.

The various factors prevalent during the market test period apparently did not necessarily maximize the sales of potato flakes. Furthermore, the analysis of research data collected by the sales audit and consumer survey methods does not substantiate the belief that the shortness of the market test period by itself invalidates an assessment of the commercial possibilities of potato flakes.

Estimates of the Potential for Potato Flakes

Although the data obtained from the retail audit and consumer survey techniques can only be considered representative of the market test area, some indications of broader applicability as to the potential of potato flakes can be inferred from available data. The particular set of market test conditions discussed earlier, namely moderately heavy promotions, high potato prices, and the shortness of the test, also should be taken into account in any projections made of the potential for potato flakes beyond the market test area.

Estimated Potato Flakes Sales for All Triple-City Retail Food Stores

Data collected from the 20 audit stores were used to make projections for the market test area. As noted earlier, these 20 stores were a sample drawn from a population of 41 chain and independent supermarkets in the Binghamton area. The remaining 21 stores were stocked with the product but not audited. 12/ Projections based on sales figures from the audit stores for the total triple-city area (339 stores) give an estimate of 897 cases, or 179 cases weekly which would be about 1.2 cases per week per 1,000 population. This sales projection was adjusted to remove the effects of in-store demonstrations. If in-store demonstration sales are included, the estimated sales for all food outlets in the market test area are a little over 1,300 cases for the 5-week period, with an average of 263 cases per week. Similar projections for other closely competing products are given in table 17.

Weekly Sales of Potato Flakes Compared With Frozen Grapefruit Sections

In 1954, the U. S. Department of Agriculture conducted a market test on frozen grapefruit sections in Erie, Pa., which was almost identical in design to that undertaken with potato flakes. While the 2 products are not directly comparable, the results of the tests may be of interest in appraising potentials. Figure 13 shows weekly sales for both flakes and grapefruit sections. In order to get a more reliable picture of sales rates of each test product, data from only the nondemonstration stores were used. Except for the first week of the 5-week period, potato flake sales were considerably higher than frozen grapefruit section sales. Potato flake sales in the nondemonstration stores averaged almost 3 cases per week. For frozen grapefruit sections, weekly sales averaged a little more than 2 cases. Several large processors and distributors of citrus products are presently marketing frozen grapefruit sections. Unofficial industry estimates show considerable increases in sales each year since the market test in the amount of frozen grapefruit sections packed for commercial sale.

Estimated Amounts of Potato Flakes Bought by Purchasing Households

An insight into the potential for potato flakes can be gained by an analysis of the amounts bought by repeat purchasers of the product. To some extent this eliminates from the analysis novelty buying by onetime purchasers induced by the promotional program for the product. Repeat purchasers are more likely to be steady buyers of the product under actual market conditions than the onetime buyers. The amounts bought by these households can serve as

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12/ A total of 339 retail food outlets were in operation in the market test area at the time of the market test. Of this total, 41 stores were supermarkets as defined by the Binghamton Press, doing approximately 85 percent of the retail food business in the area.

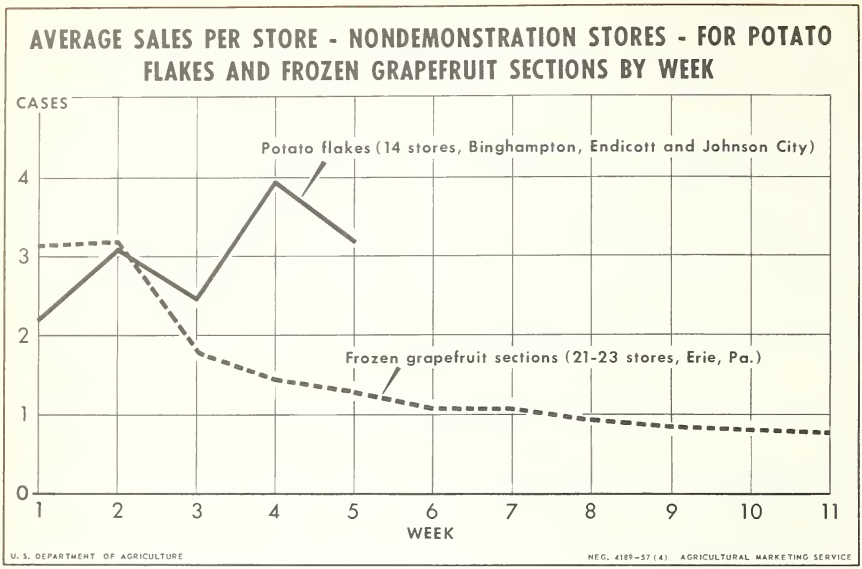

Figure 13

guidelines as to possible purchase rates once the product is generally available. The consumer survey found that about 6 in 10 of the buyers of the product made more than one purchase. Thus, the estimate for the percentage of households in the Binghamton area making repeat purchases is 8.4 percent compared to the total of 13.6 percent representing the proportion of triple-city households buying potato flakes.

Using 1950 census figures for number of families in the Binghamton area, an estimate can be made of the average amount of potato flakes bought by repeat purchasing households. In terms of fresh potato equivalent this is 7.6 pounds for the 5-week period. 13/ One way of evaluating this figure is to compare it with per capita consumption of fresh potatoes and other potato products as determined by the 1955 Food Consumption Survey. 14/ Interviews for this study

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13/ This estimate is based on the following assumption: (1) That the figure of 40,000 families arrived at in the 1950 census for the Binghamton urbanized area corresponds with the area served by the stores stocking the product and with the universe of households sampled in the surveys; and (2) that the single purchasers bought only one box of potato flakes.

14/ Food Consumption of Households in the Northeast, Household Food Consumption Survey 1955, Report No. 2, U. S. Dept. Agr., Washington, D. C., Dec. 1956.

were taken during the spring of 1955. The urban Northeast per capita figure for fresh potatoes and other potato products was 1.78 pounds per week. Assuming that the rate of consumption corresponds with the rate of purchase, the average weekly per capita consumption of potato flakes by repeat purchasers is 0.40 pound, or 22 percent of the per capita potato consumption figures given above. An interesting comparison is that processed potato products (frozen french fries, canned whole whites, potato chips) comprised only 13 percent of the total per capita potato consumption figure in the urban Northeast. (Table 18.) While the data from the two studies are not directly comparable because of time and area differences, the sizable proportion that potato flakes are of the total per capita figure is of considerable importance in estimating the potential for the test product.

Comparison With Frozen French Fried Potatoes

Another aspect of the potential for this product is its better than 1 to 1 sales ratio, on an adjusted fresh equivalent basis, with frozen french fried potatoes. Another indication that the similarity of sales for potato flakes and frozen french fried potatoes in the market test period may have wider applicability, is the close agreement between the sales audit data and the 1955 Household Consumption Survey data for frozen french fries. This can be interpreted as meaning that the market test area can be considered fairly typical of the Northeast region in its use of frozen french fried potatoes.

In 1956, an estimated 9 million bushels of fresh potatoes were utilized as frozen french fries. This is a gain of about 17 percent over the previous year. (Table 19.) The foregoing can be used as a rough guide as to the impact potato flakes could have on fresh potato utilization if adopted on a fairly large commercial scale, assuming that comparable results could be achieved in other markets and over longer periods of time.

Expectancy as to Purchase of Potato Flakes by Consumers

Perhaps the best indication as to the potential for potato flakes is the reaction of consumers already exposed to the product under actual market conditions. Both users and aware nonusers were queried about their expectations concerning the purchase of potato flakes.

About 9 in 10 homemakers who had used the product and 8 in 10 homemakers who had not used the product responded that they intended to purchase potato flakes if they were available in the future. (Table 20.)

Of the homemakers who said that they planned to purchase the product in the future, 4 in 10 users claimed the product would become part of their steady diet, while only 1 in 10 aware nonusers made such a statement. (Table 21.)

APPENDIX

Table 1.--Sales of potato flakes in Binghamton, Endicott, and Johnson City, N. Y., week of May 21, 1956, and June 18 to July 24, 1956

Week and stores	Potato flake sales			Potato flake sales with demonstration effects removed 1/
	Cases	Dollars	Pounds 2/	Cases
Sales in audit stores:				
Pretest week	0	0		0
Week 1	179	623		59
Week 2	171	596		84
Week 3	69	241		69
Week 4	104	362		104
Week 5	86	298		86
Total sales, weeks 1-5, in 20 audit stores	609	2,120	19,190	402
Weekly average, 20 audit stores	122	424		80
Average weekly sales per store, 20 audit stores	6.09	21.20		4.02
Deliveries to 21 nonaudit stores	285	992	8,978	285
Total sales 41 stores 3/	894	3,112	28,168	687
Average weekly sales per nonaudit store, 21 stores, 4 weeks	3.39	11.81		3.39
Average weekly sales for all 41 stores	4.86	16.91		3.73

1/ Effects of demonstrations were removed from the demonstration store sales for week 1 and 2 by taking the average weekly sales for the last 3 weeks for these stores and multiplying the figure times the ratio of sales in the nondemonstration stores for week 1 or week 2 to their average sales during the last 3 weeks.

2/ A ratio of 7 pounds of fresh potatoes to 1 pound of potato flakes was used for conversion to fresh potato equivalent.

3/ A few cases that remained unsold at the end of the test period are included in total as sales. Since 3 nonaudit stores did not accept delivery the first week, it is assumed that these two factors canceled each other out.

Table 2.--Comparisons of average weekly sales of potato flakes per store in demonstration and nondemonstration stores, Binghamton, Endicott, and Johnson City, N. Y., June 18-July 24, 1956

Week	Demonstration stores	Nondemonstration stores	Weekly ratio demonstration stores to nondemonstration stores
	Cases	Cases	Cases
1	24.68	2.20	11.2 to 1
2	21.32	3.10	6.9 to 1
3	5.75	2.47	2.3 to 1
4	8.19	3.93	2.1 to 1
5	6.87	3.17	2.2 to 1

Table 3.--Replies to the question: "How did you learn that potato flakes were being sold?"

Replies	Users	Aware - nonusers
	Percent 1/	Percent 1/
From newspaper, radio, or television	83	64
Saw product in stores	82	45
Someone told me	43	43
Received sample in store	16	5
Number of cases	294	278

1/ Percentages add to more than 100 because some homemakers gave more than 1 reply.

Table 4.--Relation between purchase of potato flakes in last 2 months and personal characteristics of homemaker who purchased the product

Personal characteristics	Replies to question: "Have you bought any of these potato flakes in the last 2 months?"			Homemakers
	Yes	No	Total	
	Percent	Percent	Percent	Number
All homemakers 1/	14	86	100	2,228
Age: 2/				
Under 35	10	90	100	785
35 - 44	14	86	100	511
45 and older	16	84	100	834
Education: 3/				
Grammar	12	88	100	389
High school	13	87	100	1,459
College	13	87	100	352
Income: 4/				
Low	13	87	100	433
Middle	13	87	100	1,123
High	15	85	100	400

1/ Includes all homemakers who had bought but not used the product at the time of the survey.
2/ Age was not ascertained for 21 homemakers.
3/ Education was not ascertained for 10 homemakers.
4/ Income was not ascertained for 70 homemakers.

Table 5.--Relation between times potato flakes were purchased in last 2 months and personal characteristics of homemakers who used the product

Personal characteristics	Number of times purchased			Home-makers
	Once	Two or more	Total	
	Percent	Percent	Percent	Number
All homemakers	38	62	100	305
Age: 1/				
Under 35	35	65	100	82
35 - 44	32	68	100	72
45 and older	40	60	100	126
Education: 2/				
Grammar school	42	58	100	45
High school	33	67	100	192
College	44	56	100	45
Income: 3/				
Low - up to $2,499	43	57	100	56
Middle - $2,500 - $3,999	39	61	100	140
High - $4,000 and above	28	72	100	58
Size of family: 4/				
1 or 2 persons	42	58	100	83
3 to 4 persons	30	70	100	110
5 or more persons	38	62	100	95

1/ Age was not ascertained for 8 homemakers; replies to the question were not ascertained for 6 homemakers.

2/ Education was not ascertained for 7 homemakers; replies to the question were not ascertained for 5 homemakers.

3/ Income was not ascertained for 36 homemakers; replies to the question were not ascertained for 4 homemakers.

4/ Replies to the question were not ascertained for 6 homemakers.

Table 6.--Relation between general satisfaction with potato flakes and personal characteristics of homemakers who used the product

Personal characteristics	Replies to the question: "In general, would you say that you are satisfied or dissatisfied with potato flakes?"			Homemakers
	Satisfied	Dissatisfied	Total	
	Percent	Percent	Percent	Number
All homemakers	88	12	100	294
Age: 1/				
Under 35	80	20	100	82
35 - 44	90	10	100	73
45 and older	92	8	100	130
Education: 2/				
Grammar school	94	6	100	48
High school	89	11	100	193
College	77	23	100	45
Income: 3/				
Low - up to $2,499	86	14	100	57
Middle - $2,500 - $3,999	90	10	100	141
High - $4,000 and above	83	17	100	59
Size of family: 4/				
1 or 2 persons	85	15	100	87
3 to 4 persons	93	7	100	109
5 or more persons	82	18	100	97

1/ Age was not ascertained for 8 homemakers; reply to the question was not ascertained for 1 homemaker.

2/ Education was not ascertained for 7 homemakers; reply to the question was not ascertained for 1 homemaker.

3/ Income was not ascertained for 36 homemakers; reply to the question was not ascertained for 1 homemaker.

4/ Reply to the question was not ascertained for 1 homemaker.

Table 7.--Relation between satisfaction with taste of potato flakes and personal characteristics of homemakers who used the product

Personal characteristics	Replies to the question: "Did you like the taste of potato flakes?"			Homemakers
	Yes	No	Total	
	Percent	Percent	Percent	Number
All homemakers	86	14	100	294
Age: 1/				
Under 35	82	18	100	82
35 - 44	88	12	100	72
45 and older	90	10	100	128
Education: 2/				
Grammar school	89	11	100	47
High school	88	12	100	191
College	74	26	100	46
Income: 3/				
Low - up to $2,499	87	13	100	54
Middle - $2,500 - $3,999	90	10	100	142
High - $4,000 and above	76	24	100	59

1/ Age was not ascertained for 8 homemakers; replies to the question were not ascertained for 4 homemakers.

2/ Education was not ascertained for 7 homemakers; replies to the question were not ascertained for 3 homemakers.

3/ Income was not ascertained for 36 homemakers; replies to the question were not ascertained for 3 homemakers.

Table 8.--Relation between homemakers' satisfaction with size of package for family and size of family

Size of family	Replies to the question: "Is it a good size for your family?" 1/			Homemakers
	Yes	No	Total	
	Percent	Percent	Percent	Number
1 or 2 persons	87	13	100	85
3 to 4 persons	88	12	100	110
5 or more persons	69	31	100	95

1/ Replies to the question were not ascertained for 4 homemakers.

Table 9.--Replies to the question: "During the last 2 months, would you say that you used Irish potatoes more than three times a week, twice a week, once a week, less than once a week, or not at all?"

Frequency of use	Users	Aware-nonusers
	Percent	Percent
More than three times a week	77	76
Twice a week	14	16
Once a week	4	7
Less than once a week	3	2
Not at all	1	--
Not ascertained, don't know	1	--
Total	100	100
Number of cases	294	278

Table 10.--Replies to the question: "At what meal do you serve Irish potatoes most often?"

Replies	Users	Aware-nonusers
	Percent	Percent
Evening meal	95	92
Noon meal	3	5
Breakfast	1/	1/
Miscellaneous	1	0
Not ascertained, don't know	1/	2
Total	100	100
Number of cases	294	278

1/ Less than 1 percent.

Table 11.--Replies to the questions: "What are your preferred ways of fixing Irish potatoes?" and "How do you fix your Irish potatoes most often?"

Replies	Users		Aware-nonusers	
	Preferred ways	Ways fixed most often	Preferred ways	Ways fixed most often
	Percent 1/	Percent 1/	Percent 1/	Percent 1/
Mashed	59	77	51	73
Boiled, stewed	32	37	37	44
Baked	12	32	12	37
Scalloped	3	14	4	17
French fried	4	18	5	23
Home fried	4	17	7	24
Potato salad	1	2	2/	6
Steamed	--	--	2/	--
Creamed	2	8	1	8
Miscellaneous	1	3	1	1
Not ascertained, don't know	2/	1	2/	--
Number of cases	204		278	

1/ Percentages add to more than 100 because some homemakers gave more than 1 reply.
2/ Less than 1 percent.

Table 12.--Potato products (other than Irish potatoes) used in the last 2 months

Items	Users	Aware-nonusers
	Percent	Percent
Potato chips	76	74
Frozen french fries	53	46
Canned white boiled potatoes	16	16
Instant or dehydrated potatoes other than flakes	13	6
Frozen patties	4	1
Potato sticks	2	1
Frozen diced	2	--
Potato puffs	--	2
Miscellaneous	2	1
Did not use other potato products	12	18
Not ascertained, don't know	1	--
Number of cases	294	278

1/ Percentages add to more than 100 because some homemakers mentioned more than 1 item.

Table 13.--Replies to the question: "Which one -- potato flakes or Irish potatoes -- do you prefer for making mashed or whipped potatoes?" and reasons for preference

Preference	Homemakers who used potato flakes and Irish potatoes	
		Percent
Irish potatoes		40
Reasons for preference:	1/	
Like taste better	39	
Like them better--general	18	
Habit--always use them	16	
Like texture better	12	
More economical	8	
Like appearance better	5	
Better for large quantities	3	
Like the mealiness	2	
Are better for you	2	
Miscellaneous	2	
Potato flakes		50
Reasons for preference:	1/	
Convenience	80	
Are more economical	13	
Like taste better	12	
Like texture better	10	
Like them better--general	5	
No waste or spoilage	5	
Fresh potatoes are poor quality now	3	
Miscellaneous	5	
No preference		9
Not ascertained, don't know		1
Total	100	
Number of cases	294	

1/ Percentages for reasons are based on the total who preferred each type and add to more than 100 because some homemakers gave more than 1 reply.

Table 14.--Audited weekly sales of potato flakes, other processed potato products, fresh potatoes in 20 sample stores, Binghamton, Endicott, and Johnson City, N. Y., weeks of May 21, 1956, June 18-July 24, 1956

Week	Audited weekly sales in 20 sample stores				
	Processed potato products 1/	Potato flakes	Total processed and potato flakes	Fresh potatoes	Total fresh and processed potatoes
	Pounds 2/	Pounds 2/	Pounds 2/	Pounds	Pounds 2/
Pretest	9,785	0	0	54,506	64,291
1	11,489	5,636	17,125	54,775	71,900
2	12,600	5,397	17,997	65,722	83,719
3	12,281	2,178	14,459	60,142	74,601
4	12,257	3,282	15,539	52,931	68,470
5	12,052	2,696	14,748	60,066	74,814
Average, weeks 1-5	12,136	3,838	15,974	58,727	74,701

1/ Potato chips, fresh potato salad, canned potato salad, canned whole potatoes, frozen french fries, frozen potato puffs, frozen potato patties, frozen whipped potatoes, and other dehydrated potato products.

2/ Fresh potato equivalent.

Table 15.--Sales of potato flakes and competing potato products in units, dollar volume, and fresh potato equivalent in 20 audit stores, Binghamton, Endicott, and Johnson City, N. Y., weeks of May 21 and June 18-July 24, 1956

Product	Unit	Sales			Dollar volume			Fresh potato equivalent		
		Pretest week	Average weeks 1-5	Total weeks 1-5	Pretest week	Average weeks 1-5	Total weeks 1-5	Pretest week	Average weeks 1-5	Total weeks 1-5
		Unit	Unit	Unit	Unit	Unit	Unit	Unit	Unit	Unit
Potato flakes	2 doz., 3-oz. boxes	0	122	609	0	424	2,120	0	3,838	19,190
Potato chips	1 doz., 8-oz. package	214	275	1,377	981	1,328	6,639	5,126	6,610	33,050
Fresh potato salad	Pounds	119	287	1,433	38	100	499	179	430	2,149
Canned potato salad	2 doz., 303 can	1	2	10	5	13	67	23	75	376
Canned whole potatoes	Dozen	17	34	172	55	110	552	392	803	4,014
Frozen french fries	2 doz., 9 oz. package	104	102	510	383	403	2,016	3,378	3,321	16,605
Frozen potato puffs	1 doz., 9 oz. package	6	7	35	14	17	87	50	63	316
Frozen potato patties	2 doz., 12-oz. package	5	7	37	22	31	154	120	165	825
Frozen whipped potatoes	Dozen	3	2	12	10	10	49	61	56	278
Total fresh potatoes	Pounds	54,506	58,727	293,636	5,146	5,681	28,406	54,506	58,727	293,636
New red	Pounds	12,753	3,190	15,952	1,206	318	1,589	12,753	3,190	15,952
New white	Pounds	22,879	42,609	213,044	2,252	4,070	20,348	22,879	42,609	213,044
California	Pounds	2,363	12,458	62,290	213	1,273	6,364	2,363	12,458	62,290
Old	Pounds	16,511	470	2,350	1,475	21	105	16,511	470	2,350

Table 16.--Sales per 100 customers and average prices for potato flakes and competing potato products in units and pounds fresh potato equivalent, Binghamton, Endicott, and Johnson City, N. Y., June 18-July 24, 1956

Product	Unit	Sales per 100 customers	Average price per unit	Average price per pound fresh potato equivalent
		Unit	Cents	Cents
Flakes--audited sales	3-oz. box	3.38	14.5	11.0
Potato chips	8-oz. package	3.82	40.2	20.1
Fresh potato salad	Pounds	.33	34.8	23.2
Canned potato salad	303 can	.06	26.6	17.7
Canned whole potatoes	303 can	.95	13.4	13.8
Frozen french fries	9-oz. package	2.83	16.5	12.1
Frozen potato puffs	9-oz. package	.10	20.6	27.5
Frozen potato patties	12-oz. package	.20	17.5	18.7
Frozen whipped potatoes	12-oz. package	.06	17.7	17.7
Fresh potatoes	Pounds	67.81	9.7	9.7

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Table 17.--Projected sales for potato flakes and competing potato products for the triple cities based on sales in 20 audit stores, Binghamton, Endicott, and Johnson City, N. Y., June 18-July 24, 1956

Product	Unit	Average weeks 1-5	Total weeks 1-5
		Unit	Unit
Flakes--audited sales base	2 doz., 3-oz. box	263	1,314
Flakes--adjusted sales base	2 doz., 3-oz. box	179	897
Potato chips	1 doz., 8-oz. package	624	3,122
Fresh potato salad	Pounds	651	3,255
Canned potato salad	2 doz., 303 can	5	26
Canned whole potatoes	2 doz., 303 can	81	406
Frozen french fries	2 doz., 9-oz. package	237	1,185
Frozen potato puffs	1 doz., 9-oz. package	16	79
Frozen potato patties	2 doz., 12-oz. package	17	83
Frozen whipped potatoes	2 doz., 12-oz. package	6	28
Total fresh potatoes	Pounds	134,881	674,404

Table 18.--Comparisons for potatoes and potato products of estimates based on data from the 1955 Food Consumption Survey 1/ with projections from audited sales, Binghamton, Endicott, and Johnson City, N. Y., June 18-July 24, 1956

Product	1955 Food Consumption Survey Data		Market test data	
	Average consumption per household	Total consumption triple cities 2/	Average weekly sales per household 2/	Average weekly sales triple cities
	Pounds 3/	Pounds 3/	Pounds 3/	Pounds 3/
Fresh potatoes	5.12	204,800	3.37	137,881
Frozen french fries	.216	8,640	.193	7,734
Canned whole potatoes	.01	400	.048	1,933
Potato chips	.36	14,400	.375	14,984
Potato flakes	0	0	.207	8,281

1/ A national sample of households were interviewed to determine their food consumption for a 1-week period in the spring of 1955. The report containing the data used is Food Consumption of Households in the Northeast, Household Food Consumption Survey 1955, Report No. 2, 195 pp., U. S. Dept. Agr.

2/ This assumes 40,000 households in the test area--an assumption based on 1950 census figures for the Binghamton urbanized area.

3/ Processed potato products in fresh potato equivalent.

Table 19.--United States production, utilization, and use of designated potato crop[1]

CROP YEAR	1940	1949	1950	1951	1952	1953	1954	1955	1956[2]
					1,000 BUSHELS				
Production	376,920	401,583	431,940	326,359	351,895	386,209	365,985	378,486	405,397
Imports	930	10,100	5,349	2,309	3,283	2,924	1,780	3,648	2,700
Total Supply	377,850	411,683	437,289	328,668	355,178	389,133	367,765	382,134	408,097
Exports	2,495	11,462	5,534	6,707	4,366	4,603	7,123	6,590	6,697
Shipments to Territories	1,788	879	1,109	1,074	1,033	1,105	1,407	1,309	1,400
Total Off Shore Sales	4,283	12,341	6,643	7,781	5,399	5,708	8,530	7,899	8,097
Available Domestic Use	373,567	399,342	430,646	320,887	349,779	383,425	359,235	374,235	400,000
Used for Seed	41,985	35,823	29,079	31,050	35,689	32,221	33,163	32,465	32,000
Fed to Livestock[6]	37,238	76,216	100,869	19,664	21,761	32,320	26,167	28,395	35,600
Starch[6]	8,030	12,975	21,682	4,701	8,264	16,500	11,000	20,752	29,000
Alcohol[6]	.....	763	.....	.....	.....	.....	.....	.....	.....
TOTAL NON FOOD USE	87,253	125,777	151,630	55,415	65,714	81,041	70,330	82,112	96,600
TOTAL FOOD USE	286,314	273,565	279,016	265,472	284,065	302,384	288,905	292,123	303,400
Military Use—Fresh	.....	5,000	8,000	9,900	7,900	7,700	7,000	7,000	7,000
Est. Civilian Use	286,314	268,565	271,016	255,572	276,165	294,684	281,905	285,123	296,400[5]
PROCESSED[3]									
Flour[6]	400	1,147	1,200	500	400	1,550	2,600	2,900	3,000
Dehydration[6]	.....	582	3,081	2,620	1,220	3,400	3,000	4,700	6,000
Canning	.....	830	865	1,000	1,450	1,330	800	1,300	1,400
Hash, Stews, Soups	500	1,500	1,500	1,200	1,000	1,000	800	800	800
Frozen French Fried	.....	900	1,200	2,000	2,400	2,700	3,600	7,700	9,000
Potato Chips	4,500	20,100	21,200	22,760	25,250	29,000	32,000	39,346	45,000
Total Processed	5,400	25,059	29,046	30,080	31,720	38,980	42,800	56,746	65,200
Est. Sold to Restaurants[3]	40,000	56,000	57,500	59,000	60,000	63,000	64,000	65,000	65,000[4]
Total Use for Processed & Restaurants	45,400	81,059	86,546	89,080	91,720	101,980	106,800	121,746	130,200
Est. Total Used Fresh in Homes	240,914	187,506	184,470	166,492	184,445	192,704	175,105	163,377	166,200
Used on Farms	63,099	29,785	29,073	24,912	21,746	20,886	21,209	20,703	20,000
Purchased Fresh for Home Use[5]	177,815	157,721	155,397	141,580	162,699	171,818	153,896	142,674	146,200[5]
Civilian Pop. July 1 (Millions)	134.0	149.6	152.3	153.2	155.5	158.3	161.3	164.5	167.5
Per Capita Consumption Crop Yr.	128.0	107.7	106.8	100.1	103.0	111.7	104.9	104.0	106.2
Per Capita Consumption Calendar Yr.—Pounds	121.0	109.0	102.0	108.0	99.0	103.0	106.0	103.0	101.0
Per Capita Pounds Processed Used as Food—Pounds	1.9	10.1	11.4	11.8	12.2	14.8	15.9	20.7	23.4

[1] Source: Agricultural Marketing Service except as noted.
[2] Dec., 1956 U.S.D.A. Crop Report.
[3] Industry estimates.
[4] Includes an estimated 4,000,000 bushels of prepeeled potatoes.
[5] Includes an estimated 70,000,000 bushels packed in consumer size packages of 25 pounds and smaller.
[6] Includes quantities processed or fed under the diversion program of 1949, 1950, 1954, 1955 and 1956.

Compiled by National Potato Council.

Table 20.--Replies to the question: "If potato flakes continue to be sold locally, do you think you will purchase the product in the future?"

Replies	Users	Aware-nonusers
	Percent	Percent
Yes	89	77
No	11	17
Not ascertained, don't know	--	6
Total	100	100
Number of cases	294	278

Table 21.--Replies to the question: "Are you planning to make this product a steady item in your diet or an occasional item in your diet?"

Replies	Users	Aware-nonusers
	Percent	Percent
Steady diet	44	11
Occasional diet	53	60
Not ascertained, don't know	3	29
Total	100	100
Number of cases	261	213

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